

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 29 MAR 2005	
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Applicant's or agent's file reference FGPE03-004	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/KR2003/002468	International filing date (day/month/year) 17 NOVEMBER 2003 (17.11.2003)	Priority date (day/month/year) 16 NOVEMBER 2002 (16.11.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 H01L 33/00		
Applicant LG INNOTEK CO.,LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 06 APRIL 2004 (06.04.2004)	Date of completion of this report 25 FEBRUARY 2005 (25.02.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea	Authorized officer KIM, Dong Yup Telephone No. 82-42-481-5749
Facsimile No. 82-42-472-7140	

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/002468

I. Basis of the report

1. With regard to the elements of the international application:*

the international application as originally filed

the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

the language of publication of the international application (under Rule 48.3(b)).

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

the description, pages _____

the claims, Nos. _____

the drawings, sheets _____

5.

This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed," and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

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International application N .

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IV. Lack of unity of invention**1. In response to the invitation to restrict or pay additional fees the applicant has:**

- restricted the claims.
- paid additional fees.
- paid additional fees under protest.
- neither restricted nor paid additional fees.

2. This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:**3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is**

- complied with.
- not complied with for the following reasons:

1. Group 1 : Claims 1-10 and 27-34 are directed to an optical device comprising a metal-Ga compound layer / a metal layer / a metal-Al compound layer / an anti-oxidation layer.
2. Group 2 : Claims 11-19 and 35-43 are directed to an optical device comprising an anti-oxidation layer / a complex oxidation layer made by the reaction of metals / metal dots.
3. Group 3 : Claims 20-22 are directed to an optical device comprising a highly-doped metal oxide layer / a transparent electrode formed on it.
4. Group 4 : Claims 23-26 and 44-52 are directed to an optical device and manufacturing method thereof containing an electrode comprising a contact layer / a bonding pad / a diffusion barrier layer.

All the searchable claims could be searched without efforts justifying an additional fee, and the international search report and the written opinion are covered by all the claims.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- all parts.
- the parts relating to claims Nos.

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V. Reasons statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-52	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	11-19, 35-43	YES
	Claims	1-10, 20-22, 23-36, 27-34, 44-52	NO
Industrial applicability (IA)	Claims	1-52	YES
	Claims	NONE	NO

2. Citations and explanations (Rule 70.7)

1) Documents cited in the International Search Report

D1 : KR 226831 B D2 : KR2000-71682 A D3 : JP 11-40853 A
 D4 : JP 11-97744 A D5 : JP 8-32115 A D6 : KR 286699 B
 D7 : JP 11-74558 A D8 : KR 2001-14823 A D9 : KR 2002-31683 A

2) Inventive Step

2.1 The subject matter of the present claims 1-10, 27-34 lacks an inventive step. The subject matter of claims 1-10 and 27-34 is about an optical device comprising a metal-Ga compound layer / a metal layer / a metal-Al compound layer / an anti-oxidation layer.

But D1 discloses a semiconductor Light Emitting Diode in which the electrode is composed of GaTi (or GaTiN)-Al-Au compound layer (figure 2 and figure 3 of D1)

Even though there is not a direct description for a high impurity GaN layer neither an anti-oxidation layer, the technical features for a cap layer and an anti-oxidation layer are included among the several straightforward possibilities from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of claims 1-10 and 27-34 lacks an inventive step under PCT Article 33(3).

2.2 The Subject matter of present claims 20-22 lacks an inventive step

The subject-matter of claims 20-22 is about an optical device comprising a highly-doped metal oxide layer and a transparent layer formed on it.

But D2 discloses an LED having an electrode comprising a transparent layer / a Au layer (embodiments 1-3).

So, the technical features of claims 20-22 are already disclosed in D2 in a similar field of application, or are included among the several straightforward possibilities from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of claims 20-22 lacks an inventive step under PCT Article 33(3).

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Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

BOX V

2.3 The subject matter of the present claims 23-26, 44-52 lacks an inventive step
The subject-matter of claims 23-26 and 44-52 is about an optical device comprising a contact layer / a bonding pad / a diffusion barrier layer.

But D4 discloses an LED in which a p-typed semiconductor layer and a highly-doped p-typed semiconductor layer and an electrode layer are included (claims 1-4 and figure 6), and D5 discloses an electrode composed of a contact layer and a Pd layer and a Ti layer (claims 1-4 and figures 2, 4).

So, the technical features of claims 23-26 and 44-52 are already disclosed in D4 and D5 in a similar field of application, or are included among the several straightforward possibilities or combinations of the cited inventions from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of claims 23-26 and 44-52 lacks an inventive step under PCT Article 33(3).

2) Industrially Applicability

The present application is believed to be industrially applicable according to PCT Article 33(4).